CLAIMS

We claim:

1. A method of generating an authentication key that can be used to authenticate an electronic document file representative of a document, comprising:

providing the electronic document file as an initial digital file;

applying a predetermined halftoning process to the digital file to generate a digital halftone file comprising a plurality of discrete digital values; and

performing a predetermined mathematical process on the plurality of discrete digital values to thereby generate the authentication key.

2. The method of claim 1, and further comprising printing the digital halftone file to provide a tangible copy of the document containing a visible representation of the authentication key.

3. The method of claim 1, and further comprising displaying the digital halftone file on a user display to provide a visible copy of the document and the authentication key.

4. The method of claim 1, and wherein the halftoning process is based, at least in part, on an error diffusion halftoning algorithm.

5. The method of claim 1, and wherein the halftoning process is based, at least in part, on one of a matrix-based halftoning algorithm, a pattern-based halftoning algorithm, or an ordered-dither halftoning algorithm.

6. The method of claim 1, and wherein the predetermined mathematical process is a summation process.

7. A method of authenticating an electronic document file representative of a document, comprising:

receiving the electronic document file as an initial digital file;

applying a predetermined halftoning process to the digital file to generate a digital halftone file comprising a plurality of discrete digital values;

performing a predetermined mathematical process on the plurality of discrete digital values to generate an authentication key; and

using the authentication key to authenticate the electronic document file.

8. The method of claim 7, and wherein using the authentication key to authenticate the electronic document file comprises:

receiving a sender authentication key; and

comparing the sender authentication key to the generated authentication key and, if the keys are the same, authenticity of the electronic document file is verified.

9. The method of claim 7, and wherein the halftoning process is based, at least in part, on an error diffusion halftoning algorithm.

10. The method of claim 7, and wherein the halftoning process is based, at least in part, on one of a matrix-based halftoning algorithm, a pattern-based halftoning algorithm, or an ordered-dither halftoning algorithm.

11. The method of claim 7, and wherein the predetermined mathematical process is a summation process.

12. The method of claim 9, and wherein the electronic document file is received from a sender via a network.

13. The method of claim 10, and wherein the sender authentication key is received via one of telephone or facsimile.

14. A system to generate an authentication key to be used to authenticate an electronic document file representative of a document, comprising:

a processor; and

a computer readable memory device which is readable by the processor, the computer readable memory device containing a series of computer executable steps configured to cause the processor to:

retrieve a copy of the electronic document file as an initial digital file;

apply a predetermined halftoning process to the initial digital file to generate a digital halftone file comprising a plurality of discrete digital values;

perform a predetermined mathematical process on the plurality of discrete digital values to thereby generate the authentication key; and

store a copy of the authentication key in the computer readable memory device.

15. The system of claim 14, and wherein the processor and the computer readable memory device are resident within a document printing device.

16. The system of claim 15, and wherein the series of computer executable steps are further configured to cause the processor to print a tangible copy of the halftone image file as the document, and to include the authentication key on the tangible copy of the halftone image file.

17. The system of claim 14, and wherein the computer readable memory is configured to store, at least temporarily, a copy of the electronic document file as the initial digital document file.

18. The system of claim 15, and further comprising a user display, and wherein the series of computer executable steps are further configured to cause the processor to display, via the user display, the authentication key.

19. A system for authenticating an electronic document file representative of a document, comprising:

a processor;

a computer readable memory device which is readable by the processor and which is configured to receive the electronic document file as an initial digital file; and wherein:

the computer readable memory device contains a series of computer executable steps configured to cause the processor to:

store the initial digital file in the computer readable memory device;

apply a predetermined halftoning process to the initial digital file to generate a digital halftone file comprising a plurality of discrete digital values;

perform a predetermined mathematical process on the plurality of discrete digital values to thereby generate the authentication key; and

display a copy of the authentication key to a user via one of a printer or a user display.

20. The system of claim 19, and further comprising a modem configured to receive the initial digital file from a sender and communicate the file, via the processor, to the computer readable memory device.

21. The system of claim 19, and further comprising one of a telephone or a facsimile machine configured to receive a sender authentication key that can be compared to the generated authentication key to authenticate the electronic document file.

22. The system of claim 19, and wherein the processor and the computer readable memory device are resident within a document printing device.

23. An system to authenticate an electronic document file, comprising:

a sender computer configured to provide the electronic document file in the form of a sender initial digital file;

a sender printer configured to:

receive the sender initial digital file;

apply a predetermined halftoning process to the sender initial digital file to generate a first digital halftone file comprising a first plurality of discrete digital values;

perform a predetermined mathematical process on the first plurality of discrete digital values to thereby generate a sender authentication key; and

display the sender authentication key to a sender;

a receiver computer configured to receive the electronic document file from the sender as a receiver initial digital file;

a receiver printer configured to:

receive the receiver initial digital file;

apply the predetermined halftoning process to the receiver initial digital file to generate a second digital halftone file comprising a second plurality of discrete digital values;

perform the predetermined mathematical process on the second plurality of discrete digital values to thereby generate a receiver authentication key; and

display the receiver authentication key to a receiver.

24. The system of claim 23, and further comprising a network connection configurable to allow the sender computer to send the sender initial digital file to the receiver computer.

25. The system of claim 23, and further comprising one of:

a sender telephone and a receiver telephone to allow the sender to communicate the sender authentication key to the receiver; or

a sender facsimile machine and a receiver facsimile machine to allow the sender to communicate the sender authentication key to the receiver.